

WHAT IS CLAIMED IS:

1. An ink jet recording head comprising a nozzle opening, a pressure generating chamber, a reservoir, and an ink supply port, at least one of said pressure generating chamber and said reservoir  
5 being sealed by a plate member which is partly elastically deformable, wherein

said plate member is constructed by a substantially rectangular base member in which an elastic plate that can be elastically deformed by an external pressure, and that has an ink  
10 resistance, and a rolled metal plate that is produced by rolling an etchable metal material are laminated with each other, and a longitudinal direction of said base member is perpendicular to a rolling direction of said rolled metal plate.

2. An ink jet recording head according to claim 1, wherein  
15 said elastic plate includes a polymer film.

3. An ink jet recording head according to claim 1, wherein said elastic plate includes a polymer film which is annealed before said elastic plate is laminated with said rolled metal plate.

4. An ink jet recording head according to claim 1, wherein  
20 said elastic plate includes a metal plate that can be elastically deformed by an external pressure, and that has an ink resistance, and is laminated with said rolled metal plate via an adhesive agent layer.

5. An ink jet recording head comprising: a channel unit having a nozzle opening, a pressure generating chamber, a reservoir, an ink supply port, said channel unit being sealed by a plate member having an island portion which is opposed to said pressure generating chamber, and a diaphragm portion; and a piezoelectric vibrator which abuts against said island portion to eject an ink droplet, wherein

said plate member is constructed by a substantially rectangular base member in which an elastic plate that can be elastically deformed by a displacement of said piezoelectric vibrator, and that has an ink resistance, and a rolled metal plate that is produced by rolling an etchable metal material are laminated with each other, and a longitudinal direction of said base member is perpendicular to a rolling direction of said rolled metal plate.

6. An ink jet recording head according to claim 5, wherein said elastic plate includes a polymer film.

7. An ink jet recording head according to claim 5, wherein said elastic plate includes a polymer film which is annealed before said elastic plate is laminated with said rolled metal plate.

8. An ink jet recording head according to claim 5, wherein said elastic plate includes a metal plate that can be elastically deformed by an external pressure, and that has an ink resistance,

and is laminated with said rolled metal plate via an adhesive agent layer.

9. An ink jet recording head according to claim 5, wherein said rolled metal plate is etched so as to form said island portion.

5 10. An ink jet recording head according to claim 5, wherein said diaphragm portion is formed by etching away said rolled metal plate in a region which is opposed to said reservoir.

11. An ink jet recording head according to claim 5, wherein a plurality of said island portions are arranged in a direction  
10 parallel to said longitudinal direction.

12. An ink jet recording head according to claim 5, wherein a plurality of said island portions are arranged in a direction perpendicular to said longitudinal direction.

13. An ink jet recording head comprising a channel unit and  
15 a plurality of actuator units, said channel unit being constructed by laminating a nozzle plate in which a nozzle opening is formed, a reservoir forming substrate in which a communication hole forming a reservoir is opened, and a plate member which seals another face of said reservoir to form an ink channel between said  
20 reservoir and said actuator units, and which functions as an attachment member for said actuator units, each of said actuator units being constructed by sequentially laminating a sealing substrate, a pressure generating chamber forming substrate, and

a diaphragm and being fixed to a surface of said plate member of said channel unit, wherein

said plate member is constructed by a substantially rectangular base member in which an elastic plate that can be elastically deformed by a pressure in said reservoir, and that has an ink resistance, and a rolled metal plate that is produced by rolling an etchable metal material are laminated with each other, and said actuator units are arranged in a direction which is perpendicular to a rolling direction of said rolled metal plate.

14. An ink jet recording head according to claim 9, wherein said elastic plate is placed on a face which is opposed to said reservoir, and said rolled metal plate is formed by etching away a region which is opposed to said reservoir.

15. An ink jet recording head according to claim 13, wherein said elastic plate includes a polymer film.

16. An ink jet recording head according to claim 13, wherein said elastic plate includes a polymer film which is annealed before said elastic plate is laminated with said rolled metal plate.

17. An ink jet recording head according to claim 13, wherein said elastic plate includes a metal plate that can be elastically deformed by an external pressure, and that has an ink resistance, and is laminated with said rolled metal plate via an adhesive agent layer.

18. An ink jet recording head according to claim 13, wherein said rolled metal plate is etched so as to form a compliance portion in said reservoir.

19. A method of producing an elastic plate for an ink jet recording head, comprising the steps of:

laminating and bonding a polymer film and a rolled metal plate to form a base member; and

etching said rolled metal plate in such a manner that a rolling direction of said rolled metal plate is parallel to a long side of an elastic plate, thereby forming a through hole serving as an elastically deformable region.

20. A method of producing an elastic plate for an ink jet recording head, comprising the steps of:

laminating and bonding a polymer film which has undergone an annealing process, and a rolled metal plate to form a base member; and

etching said rolled metal plate in such a manner that a rolling direction of said rolled metal plate is parallel to a long side of an elastic plate, thereby forming a through hole serving as an elastically deformable region.

21. A method of producing an elastic plate for an ink jet recording head, comprising the steps of:

laminating and bonding a metal plate which is elastically

deformable, and a rolled metal plate via an adhesive agent layer having an etching resistance; and

etching said rolled metal plate in such a manner that a rolling direction of said rolled metal plate is parallel to a long side of an elastic plate, thereby forming a through hole serving  
5 as an elastically deformable region.

22. A method of producing an elastic plate for an ink jet recording head, wherein a through hole is formed in such a manner that a rolling direction of a rolled metal plate is parallel to  
10 a long side of an elastic plate, and said rolled metal plate is bonded to a metal plate which is elastically deformable, via an adhesive agent layer.

23. A plate member adapted to form a part of a channel unit of an ink jet recording head, said plate member having a rolled  
15 metal plate and an elastic plate laminated on said rolled metal plate, and being substantially in the form of a rectangle having a first side and a second side shorter than said first side, a rolling direction of said rolled metal extending substantially parallel to said second side.

20 24. A plate member according to claim 23, wherein at least one row of island portions are provided in said plate member, each of said island portions is surrounded by exposed part of said elastic plate.

25. A plate member according to claim 24, wherein said row extends in a direction parallel to said second side.

26. A plate member according to claim 24, wherein said row extends in a direction perpendicular to said second side.

5 27. A plate member according to claim 23, wherein at least one diaphragm portion is provided in said plate member by exposed part of said elastic plate.

10 28. A plate member according to claim 27, wherein said diaphragm portion elongates in a direction parallel to said second side.

29. A plate member according to claim 27, wherein said diaphragm portion elongates in a direction perpendicular to said second side.

15 30. A plate member according to claim 23, wherein at least one row of compliance applying portions are provided in said plate member by exposed part of said elastic plate, and said row extends in a direction parallel to said first side.